

ABSTRACT OF THE DISCLOSURE

A digital watermark mark which is robust against alliance and average value attacks is embedded in data, and original data is protected from being tampered with. Image quality that may be obtained by an attacker by, e.g., an alliance attack is determined (step S301). In this case, LL3 is determined to be that image quality. A portion to be modified of high-image quality portions is determined (step S302). In this case, HL1 is determined as a high-image quality portion to be modified, and is entirely shifted rightward by 1 bit. Hence, prepared block images undergo wavelet transformation (step S303) to be decomposed into frequency components, and HL1 as the selected high-image quality portion is modified (step S304). Upon completion of the aforementioned modification process, this block undergoes inverse wavelet transformation to reclaim the block image (step S305).

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